Science Standard Articulated by Grade Level
Strand 2: History and Nature of Science

Concept 1: History of Science as a Human Endeavor Identify individual and cultural contributions to scientific knowledge.				
Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
PO 1. Give examples of how diverse people (e.g., children, parents, weather reporters, cooks, healthcare workers, gardeners) use science in daily life.	*PO 1. Give examples of how diverse people (e.g., children, parents, weather reporters, cooks, healthcare workers, gardeners) use science in daily life.*	*PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Daniel Hale Williams [physician], supports Strand 4; Charles Drew [physician], supports Strand 4; Elizabeth Blackwell [physician], supports Strand 4).*	*PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., John Muir [naturalist], supports Strand 4; Thomas Edison [inventor], supports Strand 5; Mae Jemison [engineer, physician, astronaut], supports Strand 6,; Edmund Halley [scientist], supports Strand 6).*	*PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Margaret Mead [anthropologist], supports Strand 4; Nikola Tesla [engineer, inventor] supports Strand 5; Michael Faraday [scientist], supports Strand 5; Benjamin Franklin [scientist], supports Strand 5).*
PO 2. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Jane Goodall [scientist], supports Strand 4; Louis Braille [inventor], supports Strand 4).	*PO 2. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Sally Ride [scientist], supports Strand 6; Neil Armstrong [astronaut, engineer], supports Strand 6).*	PO 2. Identify science-related career opportunities.	PO 2. Describe science-related career opportunities.	*PO 2. Describe science-related career opportunities.*

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Science Standard Articulated by Grade Level
Strand 2: History and Nature of Science

Concept 1: History of Science as a Human Endeavor Identify individual, cultural, and technological contributions to scientific knowledge.			
Grade 5	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Percy Lavon Julian [scientist], supports Strand 4; Niels Bohr [scientist], supports Strand 5; Edwin Hubble [scientist], supports Strand 6).	*PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Jacques Cousteau [inventor, marine explorer], supports Strand 4; William Beebe [scientist], supports Strand 4; Thor Heyerdahl [anthropologist], supports Strand 6).*	*PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Rachel Carson [scientist], supports Strand 4; Luis Alvarez [scientist] and Walter Alvarez [scientist], support Strand 6; Percival Lowell [scientist], supports Strand 6; Copernicus [scientist], supports Strand 6).*	*PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson and Crick [scientists], support Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).*
	PO 2. Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., Cell Theory, sonar, SCUBA, underwater robotics).	*PO 2. Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., global positioning system, telescopes, seismographs, photography).*	PO 2. Evaluate the effects of the following major scientific milestones on society: • Mendelian Genetics • Newton's Laws
	PO 3. Analyze the impact of a major scientific development occurring within the past decade.	*PO 3. Analyze the impact of a major scientific development occurring within the past decade.*	PO 3. Evaluate the impact of a major scientific development occurring within the past decade.
	PO 4. Describe the use of technology in science-related careers.	PO 4. Analyze the use of technology in science-related careers.	PO 4. Evaluate career opportunities related to life and physical sciences.

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Science Standard Articulated by Grade Level
Strand 2: History and Nature of Science

Concept 1: History of Science as a Human Endeavor Identify individual, cultural, and technological contributions to scientific knowledge.
High School
PO 1. Describe how human curiosity and needs have influenced science, impacting the quality of life worldwide. *PO 2. Describe how diverse people and/or cultures, past and present, have made important contributions to scientific innovations.* PO 3. Analyze how specific changes in science have affected society. PO 4. Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.

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Science Standard Articulated by Grade Level
Strand 2: History and Nature of Science

Concept 2: Nature of Scientific Knowledge Understand how science is a process for generating knowledge.				
Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
		PO 1. Identify components of familiar systems (e.g., organs of the digestive system, bicycle).	PO 1. Describe how, in a system (e.g., terrarium, house) with many components, the components usually influence one another.	PO 1. Explain the role of experimentation in scientific inquiry.
		PO 2. Identify the following characteristics of a system: • consists of multiple parts or subsystems • parts work interdependently	PO 2. Explain why a system may not work if a component is defective or missing.	PO 2. Describe the interaction of components in a system (e.g., flashlight, radio).
		PO 3. Identify parts of a system too small to be seen (e.g., plant and animal cells).		PO 3. Explain various ways scientists generate ideas (e.g., observation, experiment, collaboration, theoretical and mathematical models).

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Science Standard Articulated by Grade Level
Strand 2: History and Nature of Science

Concept 2: Nature of Scientific Knowledge Understand how science is a process for generating knowledge.			
Grade 5	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Provide examples that support the premise that science is an ongoing process that changes in response to new information and discoveries (e.g., space exploration, medical advances).	PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.	*PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.*	*PO 1. Apply the following scientific processes to other problem solving or decision making situations:* • *observing* • *questioning* • *communicating* • *comparing* • *measuring* • *classifying* • *predicting* • *organizing data* • *inferring* • *generating hypotheses* • *identifying variables*
PO 2. Explain the cycle by which new scientific knowledge generates new scientific inquiry.	PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.	*PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.*	*PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.*
PO 3. Describe how scientific knowledge is subject to modification and/or change as new information/technology challenges prevailing theories.	PO 3. Apply the following scientific processes to other problem solving or decision making situations: • observing • questioning • communicating • comparing • measuring • classifying • predicting • organizing data • inferring • generating hypotheses • identifying variables	*PO 3. Apply the following scientific processes to other problem solving or decision making situations:* • *observing* • *questioning* • *communicating* • *comparing* • *measuring* • *classifying* • *predicting* • *organizing data* • *inferring* • *generating hypotheses* • *identifying variables*	PO 3. Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.

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Science Standard Articulated by Grade Level
Strand 2: History and Nature of Science

Concept 2: Nature of Scientific Knowledge Understand how science is a process for generating knowledge.			
Grade 5	**Grade 6**	**Grade 7**	**Grade 8**
PO 4. Compare collaborative approaches that scientists use for investigations (e.g., teams, individual with peer review).			PO 4. Explain why scientific claims may be questionable if based on very small samples of data, biased samples, or samples for which there was no control.
PO 5. Describe qualities of the scientists' habits of mind (e.g., openness, skepticism, integrity, tolerance).			

Concept 2: Nature of Scientific Knowledge Understand how scientists evaluate and extend scientific knowledge.
High School
PO 1. Specify the requirements of a valid, scientific explanation (theory), including that it be: • logical • subject to peer review • public • respectful of rules of evidence PO 2. Explain the process by which accepted ideas are challenged or extended by scientific innovation. PO 3. Distinguish between pure and applied science. PO 4. Describe how scientists continue to investigate and critically analyze aspects of theories.

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